

EXHIBIT M

K&L GATES

April 27, 2022

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Kirill Abramov
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Group Vice President and Associate General Counsel, Intellectual Property Law
Charter Communications, Inc.
400 Atlantic Street, 10th Floor
Stamford, CT 06901

Re: Entropic Communications LLC's Patents

Dear Mr. Abramov:

I am outside legal counsel for Entropic Communications LLC ("Entropic"). Entropic's CEO, Boris Teksler, is writing to you directly. In conjunction with his letter, Entropic has instructed me to write to you regarding Entropic's patent portfolio.

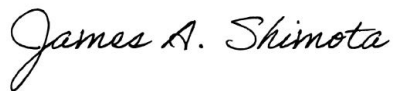
Entropic owns numerous patents as listed in Exhibit A attached hereto. The portfolio represents a long and rich history of innovation. You should evaluate this portfolio carefully, as Entropic is open to discussing appropriate licenses to the patents.

At present I draw your particular attention to six of these patents, selected because they are the subject of a lawsuit which will be filed today: U.S. Patent Nos. 8,223,775, 8,284,690, 8,792,008, 9,210,362, 9,825,826, and 10,135,682. Your cable television services infringe certain claims of these patents, at least as set forth in the attached charts (Exhibits B to G).

We will forward to you a courtesy copy of the litigation complaint when it is filed.

As Entropic's CEO Mr. Teksler has written to you, Entropic remains willing to discuss a reasonable business resolution to this issue. Please contact him or myself at your convenience and we will be happy to discuss.

Very truly yours,



James Shimota

Exhibit A - Entropic Patents

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EXHIBIT B

Exhibit B

**Exemplary Chart for the '775 Patent
Infringement of U.S. Patent No. 8,223,775 by Spectrum Accused Services**

#	U.S. Patent No. 8,223,775	Spectrum Accused Services
18a	A cable modem system comprising:	The Accused Services are provided by the claimed cable modem system by utilizing, for example, at least one cable modem located at each subscriber location, including, for example, the Spectrum PC20 and Arris SB6183, and products that operate in a similar manner. By way of example, the Spectrum PC20 is charted herein.
18b	a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed by the at least one processor of the first circuit causes the data networking engine to perform home networking functions including interfacing with customer provided equipment;	<p>The Spectrum PC20 includes a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed by the at least one processor of the first circuit causes the data networking engine to perform home networking functions including interfacing with customer provided equipment.</p> <p>Specifically, the Spectrum PC20 includes a Broadcom BCM3390 SoC.</p>

Exhibit B


#	U.S. Patent No. 8,223,775	Spectrum Accused Services
		 <p>The Spectrum PC20, via the Broadcom BCM3390, has a dedicated cable modem CPU, a dedicated multi-threaded applications processor, and multiple hardware off-load engines. The multi-threaded applications processor implements a data networking engine. The data networking engine performs home networking functions including interfacing with customer provided equipment.</p>
18c	a cable modem engine implemented in a second circuit that includes at least	The Spectrum PC20 has a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit, the cable modem engine programmed with software that when executed by the at least one

Exhibit B

#	U.S. Patent No. 8,223,775	Spectrum Accused Services
	<p>one processor, the second circuit being separate from the first circuit, the cable modem engine programmed with software that when executed by the at least one processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine, the cable modem functions including interfacing with cable media, and the cable modem engine configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the data networking engine, the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor, the DOCSIS MAC processor configured to process downstream PDU packets</p>	<p>processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine, the cable modem functions including interfacing with cable media, and the cable modem engine configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the data networking engine, the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor, the DOCSIS MAC processor configured to process downstream PDU packets and forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput.</p> <p>Specifically, the Spectrum PC20 has a dedicated cable modem CPU, a dedicated multi-threaded applications processor, and multiple hardware off-load engines. The cable modem CPU provides a cable modem engine. The cable modem CPU is separate from the multi-threaded applications processor and the hardware off-load engines. Accordingly, upgrades to the cable modem engine are independent of upgrades to the data networking engine. The cable modem CPU implements the cable modem engine. Upon information and belief, the cable modem engine includes a DOCSIS controller and a DOCSIS MAC processor, the DOCSIS MAC processor configured to process downstream PDU packets and forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput</p>

Exhibit B

#	U.S. Patent No. 8,223,775	Spectrum Accused Services
	and forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput; and	
18d	a data bus that connects the data networking engine to the cable modem engine, wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine.	<p>The Spectrum PC20 has a data bus that connects the data networking engine to the cable modem engine, wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine.</p> <p>Specifically, the Spectrum PC20 has a dedicated cable modem CPU, a dedicated multi-threaded applications processor, and multiple hardware off-load engines. The multi-threaded applications processor provides the data networking engine and the cable modem CPU provides the cable modem engine. The cable modem CPU is separate from, the multi-threaded applications processor. Accordingly, the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine. The cable modem CPU communicates with the multi-threaded applications processor using a data bus. Accordingly, the data bus connects the data networking engine and the cable modem engine.</p>
19	A cable modem system as claimed in claim 18, wherein all DOCSIS functions are localized in the cable modem engine.	<p>In the Spectrum PC20, all DOCSIS functions are localized in the cable modem engine.</p> <p>Specifically, the Spectrum PC20 includes a dedicated cable modem CPU, a dedicated multi-threaded applications processor, and multiple hardware off-load engines. The DOCSIS functions are localized in the cable modem CPU.</p>

EXHIBIT C

Exhibit C

**Exemplary Chart for the '690 Patent
Infringement of U.S. Patent No. 8,284,690 by Spectrum Accused Services**

#	U.S. Patent No. 8,284,690	Spectrum Accused Services
1pre	A method comprising:	The Accused Services perform the claimed method utilizing, for example, including a Cable Modem Termination System ("CMTS") operated by Spectrum and at least one cable modem located at each subscriber location, including, for example, the Spectrum PC20, and products that operate in a similar manner. By way of example, the Spectrum PC20 is charted herein.
1a	a) receiving in a first node, a probe request specifying a first plurality of parameters associated with the generation and transmission of a probe, wherein the first plurality of parameters at least specify content payload of the probe and a second node;	<p>The Accused Services include receiving in a first node, a probe request specifying a first plurality of parameters associated with the generation and transmission of a probe, wherein the first plurality of parameters at least specify content payload of the probe and a second node.</p> <p>Specifically, the Spectrum PC20 samples and digitizes the entire 1GHz downstream spectrum of a cable plant and includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities. These remote diagnostic capabilities include measuring statistics of the downstream spectrum. The Spectrum PC20 provides an agent that receives requests querying the performance of the downstream spectrum from a second node. Upon information and belief, the requests include the first plurality of parameters that at least specify content payload of the probe and the second node. For example, in a deployed system, the first node may be a cable modem and the second node may be a CMTS.</p>
1b	b) determining a second plurality of parameters associated with	The Spectrum PC20 determines a second plurality of parameters associated with generation and transmission of the probe.

Exhibit C

#	U.S. Patent No. 8,284,690	Spectrum Accused Services
	generation and transmission of the probe;	Specifically, the Spectrum PC20 determines information responsive to the received request based on the measured statistics of the downstream spectrum. Upon information and belief, the information includes a second plurality of parameters associated with the generation and transmission of the probe.
1c	c) generating the probe in accordance with the first plurality of parameters and the second plurality of parameters, wherein the probe has a form dictated by the first plurality of parameters; and	<p>The Spectrum PC20 generates the probe in accordance with the first plurality of parameters and the second plurality of parameters, wherein the probe has a form dictated by the first plurality of parameters.</p> <p>Specifically, the Spectrum PC20 generates a message responsive to the received request, the message indicating the responsive information and having a particular form determined by the request.</p>
1d	d) transmitting the probe from the first node to the second node.	<p>The Spectrum PC20 transmits the probe from the first node to the second node.</p> <p>Specifically, the Spectrum PC20 transmits the message to the second node using its agent.</p>
7	The method of claim 1, wherein the probe request requests a probe that assists in diagnosing a network problem.	<p>The probe request requests a probe that assists in diagnosing a network problem.</p> <p>Specifically, the Spectrum PC20 includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities related to diagnosing network problems. Upon information and belief, Spectrum utilizes these remote diagnostic capabilities to assist in diagnosing a network problem.</p>

Exhibit C

#	U.S. Patent No. 8,284,690	Spectrum Accused Services
8	The method of claim 7, wherein the probe request is generated by a network operator and uploaded to the second node.	<p>The probe request is generated by a network operator and uploaded to the second node.</p> <p>Specifically, a collector server operated by Spectrum provides the probe request to the second node.</p>
9pre	A method comprising:	<p>The Accused Services perform the claimed method utilizing, for example, including a Cable Modem Termination System (“CMTS”) operated by Spectrum and at least one cable modem located at each subscriber location, including, for example, the Spectrum PC20, and products that operate in a similar manner. By way of example, the Arris E6000 CMTS is charted herein.</p>
9a	a) a first node transmitting a probe request to a second node, the probe request specifying a first plurality of probe parameters for a physical layer probe, the first plurality of probe parameters comprising a form for the probe including a modulation profile for the probe;	<p>The Spectrum Services include a first node transmitting a probe request to a second node, the probe request specifying a first plurality of probe parameters for a physical layer probe, the first plurality of probe parameters comprising a form for the probe including a modulation profile for the probe.</p> <p>Specifically, the Arris E6000 provides a set of SNMP (Simple Network Management Protocol) variables supported by the Arris E6000 known collectively as the MIB (Management Information Base). The MIBs includes support for per modem/per upstream channel stats, RCC definitions, per MAC event handling, per modem event handling and counts, and per modem impairment reporting. The Arris E6000 transmits, to cable modems, requests specifying parameters as defined in the MIBs. The requests have a modulation profile. For example, in a deployed system, the first node may be at least a CMTS and the second node may be a cable modem.</p>

Exhibit C

#	U.S. Patent No. 8,284,690	Spectrum Accused Services
9b	b) the first node receiving the probe from the second node, wherein the probe is generated in accordance with the first plurality of parameters and in accordance with a second plurality of parameters determined by the second node.	<p>The Arris E6000 receives the probe from the second node, wherein the probe is generated in accordance with the first plurality of parameters and in accordance with a second plurality of parameters determined by the second node.</p> <p>Specifically, the Arris E6000 receives, from the cable modems, messages responsive to the requests. The message includes data relevant to the request and generated based on the MIBs.</p>
11pre	The method of claim 9, further comprising:	See 9pre.
11a	a) the first node transmitting a second probe request to a third node;	See 9a.
11b	b) and the first node receiving a second probe from the third node, wherein the second probe is generated according to the second probe request; and	See 9b.
11d	wherein the first probe and second probe are transmitted simultaneously using OFDMA.	The first probe and second probe are transmitted simultaneously using OFDMA.
15	The method of claim 9, wherein the probe request is configured to diagnose a network problem.	<p>The probe request is configured to diagnose a network problem.</p> <p>Upon information and belief, Spectrum utilizes these remote diagnostic capabilities to assist in diagnosing a network problem. For example, the MIBs may include support for per modem/per upstream channel stats,</p>

Exhibit C

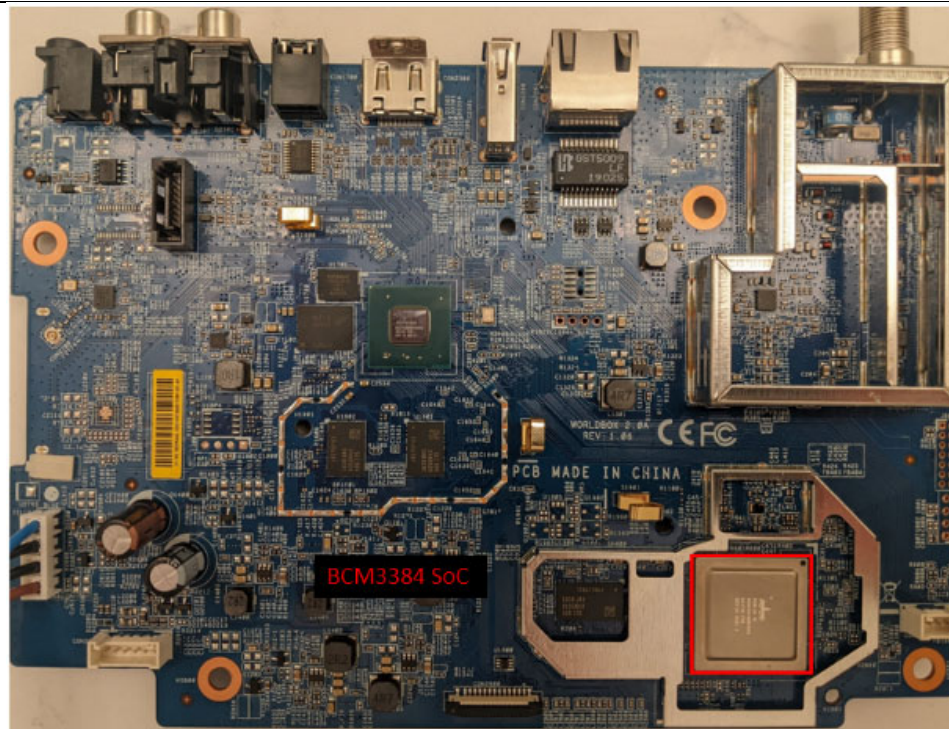
#	U.S. Patent No. 8,284,690	Spectrum Accused Services
		RCC definitions, per MAC event handling, per modem event handling and counts, and per modem impairment reporting, which can be used to diagnose a network problem.
16	The method of claim 15, wherein the probe request is generated by a network operator and uploaded to the first node.	<p>The probe request is generated by a network operator and uploaded to the first node.</p> <p>Specifically, a collector server operated by Spectrum can provide the probe request to the first node.</p>

EXHIBIT D

Exhibit D

**Exemplary Chart for the '008 Patent
Infringement of U.S. Patent No. 8,792,008 by Spectrum Accused Services**

#	U.S. Patent No. 8,792,008	Spectrum Accused Services
1a	1. A system comprising:	The Accused Services are provided by the claimed system by utilizing, for example, the Accused Set Top Products, which include at least one set top box ("STB") located at each subscriber location, including, for example, the Spectrum 100-series STBs, Spectrum 200-series STBs, Spectrum 101-series STBs, Spectrum 201-series STBs, Spectrum 110-series STBs, Spectrum 210-series STBs, the Arris DCX3600 STB, and products that operate in a similar manner. By way of example, the Spectrum 210 (specifically the Spectrum 210-T) is charted herein.
1b	an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal;	<p>The Spectrum 210 has an analog-to-digital converter operable to digitize a received signal spanning an entire television spectrum comprising a plurality of television channels, said digitization resulting in a digitized signal.</p> <p>Specifically, the Spectrum 210 has an analog to digital converter:</p>

Exhibit D

The Spectrum 210 receives the entire 1GHz downstream spectrum of a Spectrum cable plant. The 1 GHz cable spectrum includes a plurality of television channels. The Spectrum 210 digitizes the entire received signal; the digitization results in a digitized signal.

1c	a signal monitor operable to:	The Spectrum 210 has a signal monitor:
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Exhibit D

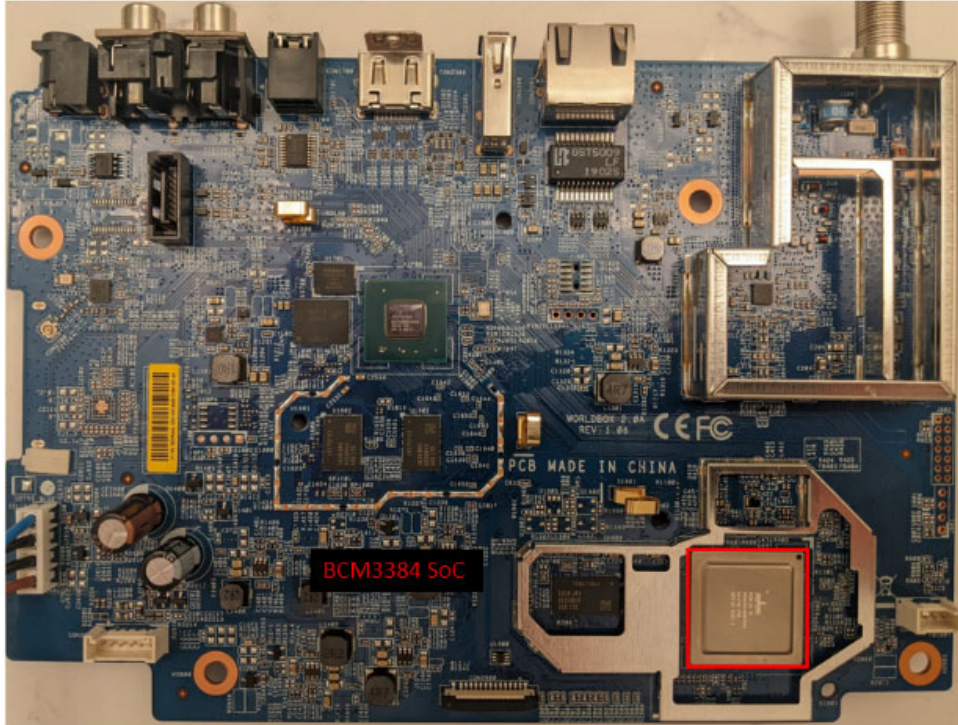
		
1d	analyze said digitized signal to determine a characteristic of said digitized signal; and	<p>The Spectrum 210 analyzes said digitized signal to determine a characteristic of said digitized signal.</p> <p>Specifically, the Spectrum 210 includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities. Upon information and belief, the Spectrum 210 analyzes, using the signal monitor, said digitized signal to determine a characteristic of said digitized signal.</p>
1e	report said determined characteristic to a source of said received signal;	<p>The Spectrum 210 reports said determined characteristic to a source of said received signal.</p>

Exhibit D

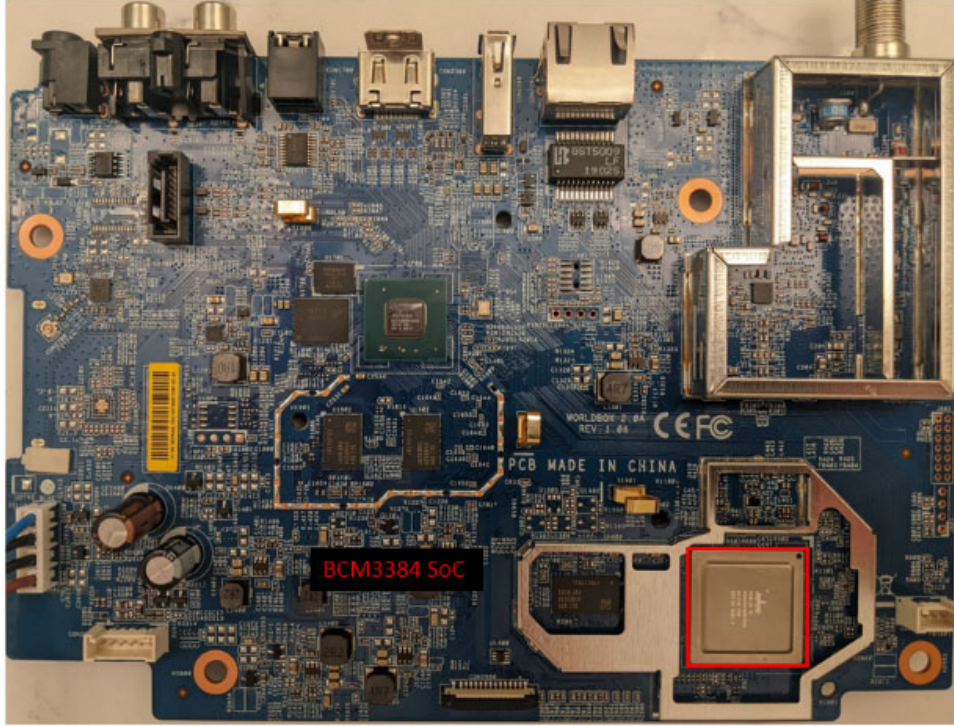
		Specifically, the Spectrum 210 includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities. Upon information and belief, the Spectrum 210 reports said determined characteristic to a source of said received signal.
1f	a data processor operable to process a television channel to recover content carried on the television channel; and	<p>The Spectrum 210 has a data processor operable to process a television channel to recover content carried on the television channel:</p>  <p>Specifically, in the Spectrum 210, each digitally tuned television channel is provided to a digital demodulator that outputs a transport stream for use in broadcast services.</p>
1g	a channelizer operable to:	The Spectrum 210 has a channelizer:

Exhibit D

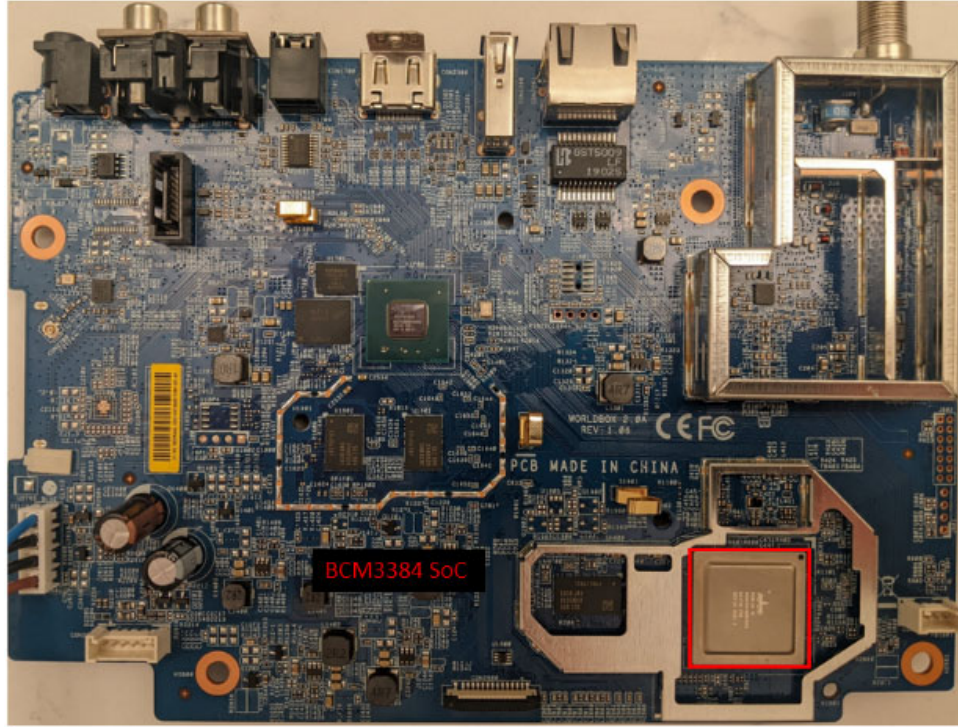
		
1h	select a first portion of said digitized signal;	<p>The Spectrum 210 selects a first portion of said digitized signal.</p> <p>Specifically, the Spectrum 210 includes advanced signal processing techniques that can be used to digitally tune multiple channels simultaneously, including selecting a first portion of said digitized signal.</p>
1i	select a second portion of said digitized signal; and	<p>The Spectrum 210 selects a second portion of said digitized signal.</p> <p>Specifically, the Spectrum 210 includes advanced signal processing techniques that can be used to digitally tune multiple channels simultaneously, including selecting a second portion of said digitized signal.</p>

Exhibit D

1j	concurrently output said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.	<p>The Spectrum 210 concurrently outputs said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.</p> <p>Specifically, the Spectrum 210 includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities without affecting user service on any downstream channels. As described above, the first portion of said digitized signal is output to said signal monitor and said second portion of said digitized signal is output to said data processor. Accordingly, the Spectrum 210 concurrently outputs said first portion of said digitized signal to said signal monitor and said second portion of said digitized signal to said data processor.</p>
2	2. The system of claim 1, wherein said first portion of said digitized signal spans said entire television spectrum.	See 1h.

EXHIBIT E

Exhibit E

**Exemplary Chart for the '362 Patent
Infringement of U.S. Patent No. 9,210,362 by Spectrum Accused Services**

#	U.S. Patent No. 9,210,362	Spectrum Accused Services
11a	A method comprising:	The Accused Services perform the claimed method utilizing, for example, the Accused Set Top Products, which include at least one set top box ("STB") located at each subscriber location, including, for example, the Spectrum 100-series STBs, Spectrum 200-series STBs, Spectrum 101-series STBs, Spectrum 201-series STBs, Spectrum 110-series STBs, Spectrum 210-series STBs, the Arris DCX3600 STB, and products that operate in a similar manner. By way of example, the Spectrum 210 (specifically the Spectrum 210-T) is charted herein.
11b	in a wideband receiver system:	The Spectrum 210 is a wideband receiver system.
11c	downconverting, by a mixer module of said wideband receiver system, a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels;	<p>The Spectrum 210 downconverts, by a mixer module of said wideband receiver system, a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels.</p> <p>Specifically, the Spectrum 210 includes advanced signal processing techniques, including a mixer, that can be used to downconvert a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels.</p>
11d	digitizing, by a wideband analog-to-digital converter (ADC) module of said wideband receiver system, said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels;	<p>The Spectrum 210 digitizes, by a wideband analog-to-digital converter (ADC) module of said wideband receiver system, said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels.</p> <p>Specifically, the Spectrum 210 digitizes the entire 1GHz downstream spectrum of a Spectrum cable plant. The 1 GHz cable spectrum includes a plurality of desired and undesired television channels.</p>

Exhibit E

11e	selecting, by digital circuitry of said wideband receiver system, said plurality of desired television channels from said digitized plurality of frequencies; and	<p>The Spectrum 210s select, by digital circuitry of said wideband receiver system, said plurality of desired television channels from said digitized plurality of frequencies as described below:</p> <p>Specifically, the Spectrum 210 includes advanced signal processing techniques that can be used to digitally tune multiple channels simultaneously, including to select the plurality of desired television channels from the digitized plurality of frequencies.</p>
11f	outputting, by said digital circuitry of said wideband receiver system, said selected plurality of television channels to a demodulator as a digital datastream.	<p>The Spectrum 110 and Spectrum 210 output, by said digital circuitry of said wideband receiver system, said selected plurality of television channels to a demodulator as a digital datastream.</p> <p>Specifically, in the Spectrum 210, the digitally tuned and selected plurality of desired television channels are then fed into a digital demodulator that outputs a transport stream for use in broadcast services.</p>

EXHIBIT F

Exhibit F

**Exemplary Chart for the '826 Patent
Infringement of U.S. Patent No. 9,825,826 by Spectrum Accused Services**

#	U.S. Patent No. 9,825,826	Spectrum Accused Services
1a	A method comprising:	The Accused Services perform the claimed method utilizing, for example, the Accused Set Top Products, which include at least one set top box ("STB") located at each subscriber location, including, for example, the Spectrum 100-series STBs, Spectrum 200-series STBs, Spectrum 101-series STBs, Spectrum 201-series STBs, Spectrum 110-series STBs, Spectrum 210-series STBs, the Arris DCX3600 STB, and products that operate in a similar manner. By way of example, the Spectrum 210 (specifically the Spectrum 210-T) is charted herein.
1b	performing by one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network:	The Spectrum 210 includes one or more circuits of a receiver coupled to a television and data service provider headend via a hybrid fiber coaxial (HFC) network, that perform the claimed steps, as described below:

Exhibit F

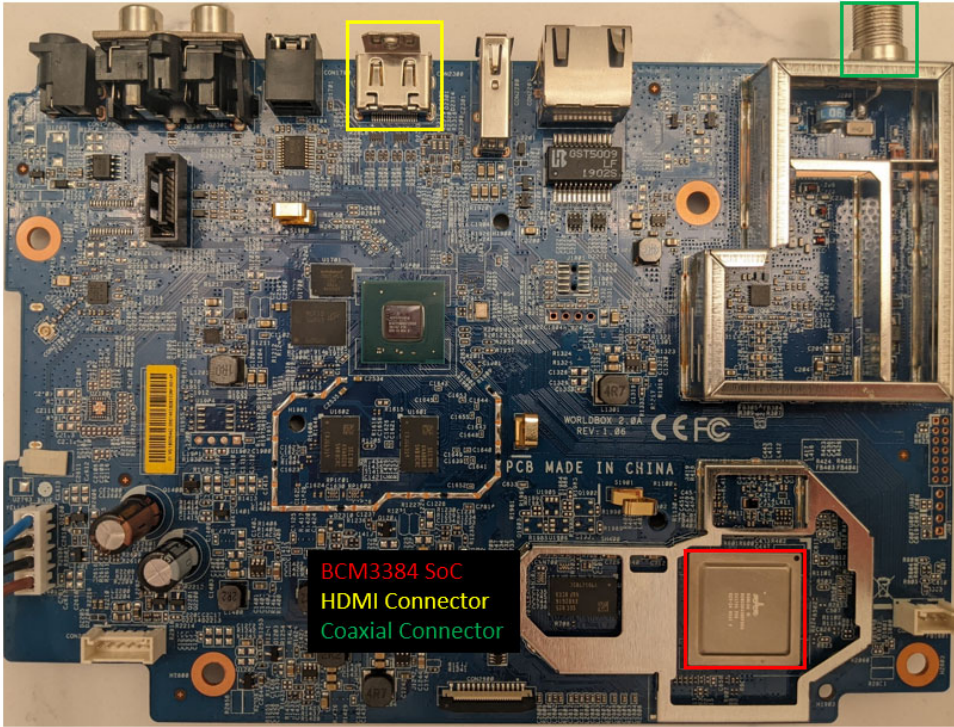
#	U.S. Patent No. 9,825,826	Spectrum Accused Services
		
1c	receiving, via said HFC network, a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels;	<p>The Spectrum 210 receives, via said HFC network, a signal that carries a plurality of channels, wherein said channels comprise one or both of television channels and data channels.</p> <p>Specifically, the Spectrum 210 receives the entire 1GHz downstream spectrum of a Spectrum cable plant. The 1 GHz cable spectrum includes a plurality of data and television channels.</p>
1d	digitizing said received signal to generate a digitized signal;	<p>The Spectrum 210 digitizes said received signal to generate a digitized signal.</p> <p>Specifically, the Spectrum 210 digitizes the entire 1GHz downstream spectrum it receives to generate a digitized signal.</p>

Exhibit F

#	U.S. Patent No. 9,825,826	Spectrum Accused Services
1e	selecting a first portion of said digitized signal;	<p>The Spectrum 210 selects a first portion of said digitized signal.</p> <p>Specifically, the Spectrum 210 includes advanced signal processing techniques that can be used to digitally tune multiple channels simultaneously, including to select a first portion of said digitized signal.</p>
1f	selecting a second portion of said digitized signal;	<p>The Spectrum 210 selects a second portion of said digitized signal.</p> <p>Specifically, the Spectrum 210 includes advanced signal processing techniques that can be used to digitally tune multiple channels simultaneously, including to select a second portion of said digitized signal.</p>
1g	processing said selected second portion of said digitized signal to recover information carried in said plurality of channels;	<p>The Spectrum 210 process said selected second portion of said digitized signal to recover information carried in said plurality of channels.</p> <p>Specifically, in the Spectrum 210, each digitally tuned channel then feeds the signal into a digital demodulator that outputs a transport stream for use in data or broadcast services.</p>
1h	analyzing said selected first portion of said digitized signal to measure a characteristic of said received signal; and	<p>The Spectrum 210 analyzes said selected first portion of said digitized signal to measure a characteristic of said received signal.</p> <p>Specifically, the Spectrum 210 includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities. Upon information and belief, the Spectrum 210 includes a signal analyzer that analyzes said selected first portion to determine one or more characteristics of the received signal.</p>
1i	controlling the transmission of network management messages back to said headend based on said measured characteristic of said received signal,	<p>The Spectrum 210 controls the transmission of network management messages back to said headend based on said measured characteristic of said received signal, wherein said measured characteristic is different than said network management messages.</p> <p>Specifically, the Spectrum 210 includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities. Upon information and belief, the</p>

Exhibit F

#	U.S. Patent No. 9,825,826	Spectrum Accused Services
	wherein said measured characteristic is different than said network management messages.	Spectrum 210 controls the transmission of network management messages back to said headend based on said measured characteristic of said received signal. Upon information and belief, said measured characteristic is different than said network management messages

EXHIBIT G

Exhibit G

**Exemplary Chart for the '682 Patent
Infringement of U.S. Patent No. 10,135,682 by Spectrum Accused Services**

#	U.S. Patent No. 10,135,682	Spectrum Accused Services
1a	A method comprising:	The Accused Services perform the claimed method utilizing, for example, including a Cable Modem Termination System ("CMTS") operated by Spectrum and at least one cable modem located at each subscriber location, including, for example, the Spectrum PC20, and products that operate in a similar manner. By way of example, the Arris E6000 CMTS is charted herein.
1b	determining, by a cable modem termination system (CMTS), for each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric;	<p>The Arris E6000 CMTS determines, for each cable modem served by said CMTS, a corresponding signal-to-noise ratio (SNR) related metric.</p> <p>Spectrum started using Arris CMTS's as early as 2014, including the E6000, Arris' CMTS that added video edge QAM components and became a fully integrated Converged Cable Access Platform. The E6000's capabilities are described, for example, in the E6000 Manual.</p> <p>Spectrum continues to use CMTSs like the E6000 to send and receive packets to downstream cable modems over the Internet. For the purposes of this analysis, the PC20 will be assessed. However, Spectrum's services are compatible with a variety of cable modems for consumers to utilize in conjunction with their services.</p> <p>Cable modems, such as the PC20, include chips capable of receiving and transmitting performance data to the CMTS, such as Broadcom's BCM3390 system-on-a-chip ("SoC")</p>

Exhibit G


#	U.S. Patent No. 10,135,682	Spectrum Accused Services
		 <p>Accordingly, cable modems, such as the PC20, are capable of bidirectional communications with upstream CMTSs, such as the E6000.</p> <p>Spectrum utilizes its CMTSs to determine a corresponding signal-to-noise ratio (SNR) related metric for each cable modem served by said CMTS. For example, according to the E6000 user manual, the CMTS utilizes a powerful spectral analysis engine built into every upstream receiver to gather detailed information about upstream channel noise.</p>

Exhibit G

#	U.S. Patent No. 10,135,682	Spectrum Accused Services
1c	assigning, by said CMTS, each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric;	<p>A service group includes one or more modems. The Arris E6000 CMTS assigns each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric.</p> <p>Specifically, the Arris E6000 CMTS utilizes a process of profiling downstream modems.</p>
1d	generating, by said CMTS for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups;	<p>The Arris E6000 CMTS generates, for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups.</p> <p>Specifically, the Arris E6000 CMTS generates SNR-related metrics based on a worst-case SNR profile of each service group. For example, the Arris E6000 CMTS optimizes a modulation profile based on worst-case noise that is expected on the upstream channel and still achieve a reasonable level of performance.</p>
1e	selecting, by said CMTS, one or more physical layer communication parameter to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and	<p>The Arris E6000 CMTS selects one or more physical layer communication parameter to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric.</p> <p>Specifically, the Arris E6000 CMTS selects one or more physical layer communication parameters to be used for communicating, via a physical layer, with each service group of downstream modems. For example, the Arris E6000 CMTS selects one or more physical communication parameters that control modems in the various upstream channels, which have been configured via the modulation profiles. For example, when adding additional forward error correction to attempt to correct for upstream errors is no longer efficient, a lower modulation rate (e.g. a physical layer communication parameter) is applied to a particular service group.</p>

Exhibit G

#	U.S. Patent No. 10,135,682	Spectrum Accused Services
1f	communicating, by said CMTS, with one or more cable modems corresponding to said one of said plurality of service groups using said selected one or more physical layer communication parameter.	<p>The Arris E6000 CMTS communicates with one or more cable modems corresponding to said one of the plurality of service groups using the selected one or more physical layer communication parameter.</p> <p>Specifically, Spectrum communicates, via its CMTSs (such as the Arris E6000 CMTS), messages that include parameters that control cable modems in one of said plurality of service groups in the various upstream channels. These communications utilize the selected one or more physical layer communication parameters.</p>